

SPRUCE MOUNTAIN WIND, LLC

Site Location of Development Act//Natural Resources Protection Act Spruce Mountain Wind Project

EXCERPTS FROM THE DEPARTMENT'S RECORD

- Project Location Map/Project Description
- Project Plans
- Department's Question & Answer Document
- Noise
- Scenic
- Decommissioning Plan & letter from the licensee dated September 24, 2010 regarding salvage values
- Wildlife
- Stormwater

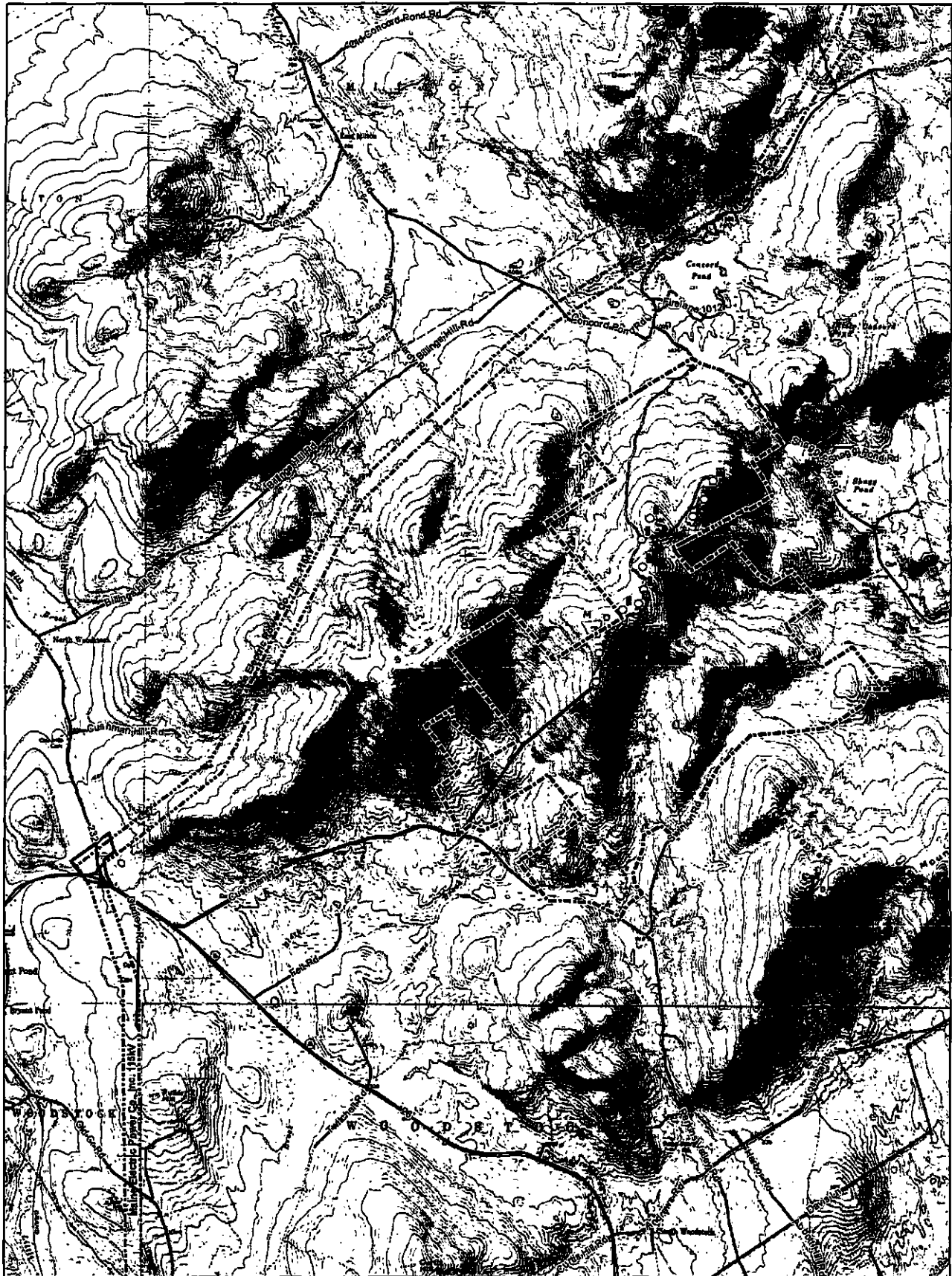
In an effort to save paper, please find the following information in the Board packet beginning at the page # listed below:

Noise

Licensee's noise model	Page #	1119
Revisions to the licensee's model	Page #	1213
EnRad's June 23, 2010 review	Page #	1165
EnRad's July 23, 2010 review	Page #	1173
Maine Center for Disease Control review dated September 27, 2010	Page #	1237

Scenic

Licensee's Visual Impact Assessment	Page #	1459
Scenic Quality Consultants June 11, 2010 review	Page #	1559
Market Decisions June 2010 Research Report	Page #	1615



Legend

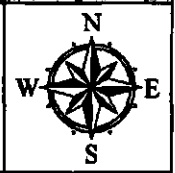
- Turbine Location (10-20-09)
- OSM Area
- Access Road
- Transmission Line
- Existing Transmission Line
- Project Boundary

0 0.25 0.5 1 Miles

Location Map
Spruce Mountain Wind Project
Woodstock, Maine
 NRPA Permit Application
 Mount Zircon USGS Quadrangle
 January 2010

TETRA TECH

PATRIOT RENEWABLES



4.0 PROJECT DESCRIPTION

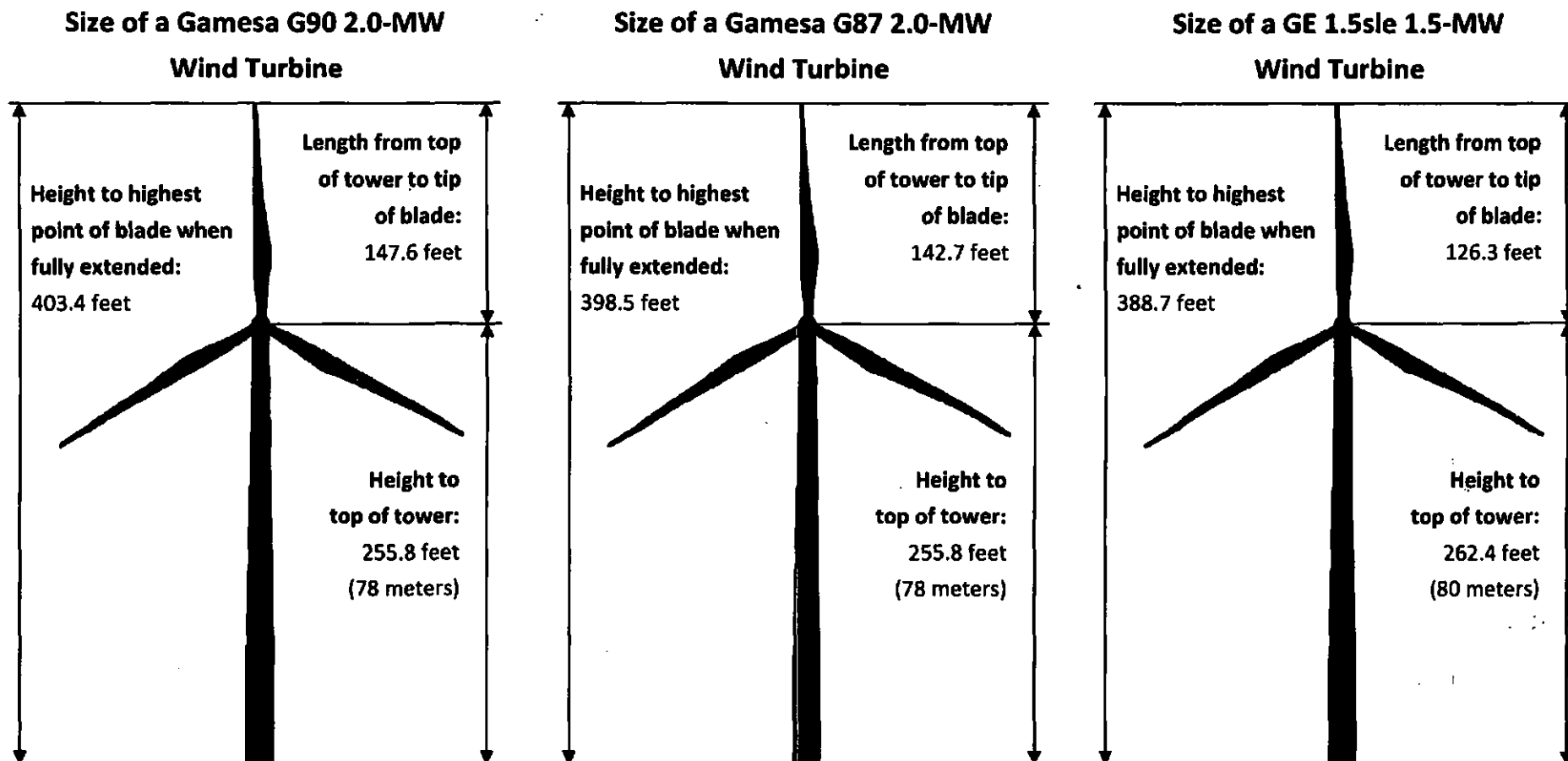
The Spruce Mountain Wind Project (Project) is an approximately 18- to 20-MW wind energy generation project proposed on approximately 2,879 acres of land located in Woodstock, Oxford County, Maine (see Section 3). Spruce Mountain Wind, LLC (SMW) is an affiliate of Patriot Renewables, LLC and shares common ownership. Both companies are owned by Jay M. Cashman, who will own approximately 1,340 acres of the project site in fee, with the rights for the remaining 1,539 acres being secured by lease agreements with landowners.

The Project will include construction of an approximately 7,200-linear-foot access road extending from Shagg Pond Road to the Spruce Mountain ridgeline where up to 11 wind turbines and an electrical collection infrastructure will be installed. The turbine portion of the Project will consist of up to 10 Gamesa (G90 or G87) 2.0-MW turbines or up to 11 General Electric (GE), 1.5-MW turbines. If Gamesa G90 and G87 turbines are used, each turbine tower will be approximately 78 meters tall (approximately 256 feet) from the ground to the center of the hub, with a 90- or 87-meter rotor, resulting in a total height from ground to the tip of a fully extended blade of a maximum 123 meters (approximately 403 feet). Alternatively, if GE 1.5sle turbines are used, each turbine tower will be approximately 80 meters (262 feet) from the ground to the center of the hub, with a 77-meter (253 feet) rotor, resulting in a total height from the ground to the tip of a fully extended blade of 119 meters (389 feet). Figure 4-1 shows the configuration for each wind turbine type. Access to the turbines along the ridgeline will be via an approximately 11,300-linear-foot access road that will connect the turbine foundations. The Project also includes an approximately 1,750-square-foot O&M building located north of the ridge and at the intersection of Shagg Pond Road and the proposed project access road. The O&M building is designed to accommodate up to six employees and will include an approximately 8,000-square-foot parking lot with seven parking spaces. The O&M building will be connected to the turbines through an overhead pole line for both electricity and fiber-optic cabling.

Power from the turbines will be collected in a 34.5-kV underground collector line system buried within the ridgeline access road work limits. The underground electric collector line will transition to an aboveground transmission line in the vicinity of the southernmost turbine (turbine 1) and continue aboveground mounted on wood poles for approximately 6,890 feet, traversing the southwest side of the mountain to Cushman Road. The transmission line will then travel west for approximately 2.8 miles along Cushman Road, Route 26, and Route 232 within the existing Maine Department of Transportation (Maine DOT) right-of-way and tap into the Woodstock Substation. From the substation, power will be converted to 115 kV and enter the regional market through transmission lines owned and operated by the Central Maine Power Company (CMP). The transmission line that will run along Cushman Road, Route 26, and Route 232 will be constructed within the existing Maine DOT right-of-way by CMP. SMW has entered into an Engineering and Procurement Agreement (E&P) with CMP to design the roadside overhead line, which will be addressed in a separate permit application submitted by CMP (see Attachment 4-1).

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Figure 4-1: Wind Turbine Dimensions



Not to Scale

Current land use in the project area consists of undeveloped forest land and commercial forestry operations in the vicinity of the proposed access road, transmission line, ridgeline, and in the vicinity of the O&M building. The topography in the project area ranges from relatively flat at the lower elevations and in the vicinity of the O&M building to moderate and steep side slopes that climb from approximately 1,000 feet (~300 meters) to 2,300 feet (~700 meters) above sea level. The ridgeline between the northernmost and southernmost proposed turbines ranges in elevation from 2,000 feet to 2,300 feet above sea level.

4.1 Construction Schedule

The schedule for construction of the Project is presented below.

Project Phase	Start Date	End Date
Mobilization and Geotechnical Surveys	May 17, 2010 (Week 1)	May 28, 2010 (Week 2)
Clearing and Grubbing	May 24, 2010 (Week 2)	July 16, 2010 (Week 9)
Road and Site Work	June 21, 2010 (Week 6)	November 5, 2010 (Week 25)
Construction of Turbine Foundations	August 16, 2010 (Week 14)	October 22, 2010 (Week 23)
Turbine Delivery and Site Placement	August 30, 2010 (Week 16)	October 8, 2010 (Week 21)
Turbine Erection	September 20, 2010 (Week 19)	December 24, 2010 (Week 32)
Ridgeline Electric Collection System	September 7, 2010 (Week 17)	November 9, 2010 (Week 26)
Mountainside Transmission Right-of-Way	December 20, 2010 (Week 32)	February 18, 2011 (Week 40)
Testing and Commissioning	January 4, 2011 (Week 34)	February 7, 2011 (Week 39)
Commercial Operations Start	February 21, 2011 (Week 41)	N/A

4.2 Project Purpose and Need

The Project's purpose is to develop a commercially viable energy generation facility that produces electricity that will supply local and regional energy demands, using a fuel (wind) that is clean, renewable, and uses a process that generates no byproducts or pollution.

The need for the Project is evidenced by the following energy policies enacted by Maine lawmakers during the past decade:

- In September 1999, the Maine's Public Utilities Commission (PUC) adopted rules for the state's Renewable Resource Portfolio Requirement, pursuant to the state's 1997 electric-utility restructuring law. The rules require each competitive electricity provider, including standard offer providers, to supply at least 30% of their total retail electric sales in Maine using electricity generated by eligible renewables and certain energy-efficiency resources. To qualify, electricity



must be generated by a facility no greater than 100 MW in capacity that uses fuel cells, tidal power, solar arrays and installations, wind power, geothermal power, hydropower, biomass power or generators fueled by municipal solid waste in conjunction with recycling. Electricity generated by efficient combined heat and power (CHP) facilities and other systems that qualify as "small power production facilities" under the federal Public Utility Regulatory Policies Act of 1978 (PURPA) also are eligible. The PUC has since designated this 30% standard the "Class II" standard.

- In 2001, Maine participated in a greenhouse gas emissions reduction effort as a member of the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP). The NEG/ECP group adopted a Climate Action Plan that established greenhouse gas reduction goals across all sectors and included a goal of reducing total greenhouse gas emissions to 10 percent below 1990 levels by the year 2020. The NEG/ECP goals were enacted into Maine law in 2004 (38 MRSA §576).
- In June 2006, Maine enacted legislation (Legislative Draft [L.D]. 2041) creating a renewable portfolio goal to increase new renewable-energy capacity by 10% by 2017. Eligible new renewables include those placed into service after September 1, 2005. Unlike the Class I standard, municipal solid waste facilities and CHP systems are not eligible under the new renewables goal, and hydropower facilities must meet all state and federal fish passage requirements. New wind-power installations may exceed 100 MW in capacity.
- Public Law 403 of 2007 converted the 2006 goal into a mandatory standard, which the PUC has since designated the "Class I" standard. The schedule for the Class I standard is as follows:
 - 1% for the period from 1/1/2008 to 12/31/2008
 - 2% for the period from 1/1/2009 to 12/31/2009
 - 3% for the period from 1/1/2010 to 12/31/2010
 - 4% for the period from 1/1/2011 to 12/31/2011
 - 5% for the period from 1/1/2012 to 12/31/2012
 - 6% for the period from 1/1/2013 to 12/31/2013
 - 7% for the period from 1/1/2014 to 12/31/2014
 - 8% for the period from 1/1/2015 to 12/31/2015
 - 9% for the period from 1/1/2016 to 12/31/2016
 - 10% for the period from 1/1/2017 to 12/31/2017, and for each year thereafter

The PUC also approved the use of NEPOOL Generation Information System certificates (which are similar to renewable-energy credits, or RECs) to satisfy the portfolio requirement. Generation Information System certificates are awarded based on the number of kilowatt-hours (kWh) of eligible electricity generated. Generation Information System certificates used to meet the Class I standard may not also be used to satisfy the Class II standard.

- Legislation enacted in June 2007 (Public Law, Chapter 403) authorized the PUC to set an alternative compliance payment (ACP) that utilities may pay instead of satisfying the standard by procuring Generation Information System certificates. The PUC set the ACP base rate for the Class I standard at \$57.12 per megawatt-hour (MWh) in 2007; this rate will be adjusted annually

for inflation beginning in 2008. The current ACP rate (2009) is \$60.92. Revenues from ACPs will be directed to the state's Renewable Resource Fund.

The PUC may review the Class I standard to determine if progress has been sufficient. The PUC may suspend scheduled increases in the Class I standard under certain circumstances. Electric providers that fail to comply with the standard are subject to certain penalties, including license revocation, an optional payment into the Renewable Resource Fund, or other monetary penalties determined by the PUC. However, the PUC may waive penalties if it determines that a utility made good faith efforts but could not reasonably satisfy the standard due to market conditions.

- Legislation enacted in April 2008 (L.D. 2283) established two goals for wind-energy development in Maine: (1) at least 2,000 MW of installed capacity by 2015; and (2) at least 3,000 MW of installed capacity by 2020, of which there is a potential to produce 300 MW from facilities located in coastal waters.

Currently Maine has 104 MW of installed wind energy generation capacity with another 158 MW slated for construction.¹ Even if all of the projects slated for construction (158 MW) and 300 MW of off-shore projects were to come on-line by 2015; a deficit of 1,492 MW would still remain.

The Spruce Mountain Wind Project would contribute up to 20 MW towards a clear need demonstrated by the State of Maine through political and legislative actions for renewable and clean energy alternatives for generation of electricity.

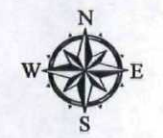
¹ AWEA (American Wind Energy Association). 2009. U.S. Wind Energy Projects - Maine, as of September 30, 2009. Accessed online December 30, 2009 at <http://www.awea.org/projects/Projects.aspx?s=Maine>.

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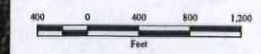
Spruce Mountain Wind, LLC

Spruce Mountain Wind Project
Woodstock, Maine
Riparian Study
Streams OS93, AS69, TS18, and TS12
Post-Construction Conditions



- LEGEND**
- Post-Construction**
- Clear
 - Vegetated
 - Final Road Construction and T-Line Corridor
- Investigated Stream**
- Contour/Ortho Estimated
 - Field Surveyed
- Vernal Pool**
- Potential Vernal Pool (PIVP)
 - Amphibian Breeding Area (ABA)
- Stream Jurisdictions**
- Ephemeral Drainage
 - MDEP and USACE Jurisdictional Stream
 - USACE Only Jurisdictional Stream
- Wetland Jurisdictions**
- MDEP and USACE jurisdictional wetlands
 - MDEP Wetland of Special Significance
- Other Features**
- Turbine Location
 - Meteorological Tower
 - 1000ft Contour
 - Project Area Parcel Boundary
 - Conservation Land Area (Cashman, Magoon, Chadborne)

July 30, 2010



GENERAL NOTES:

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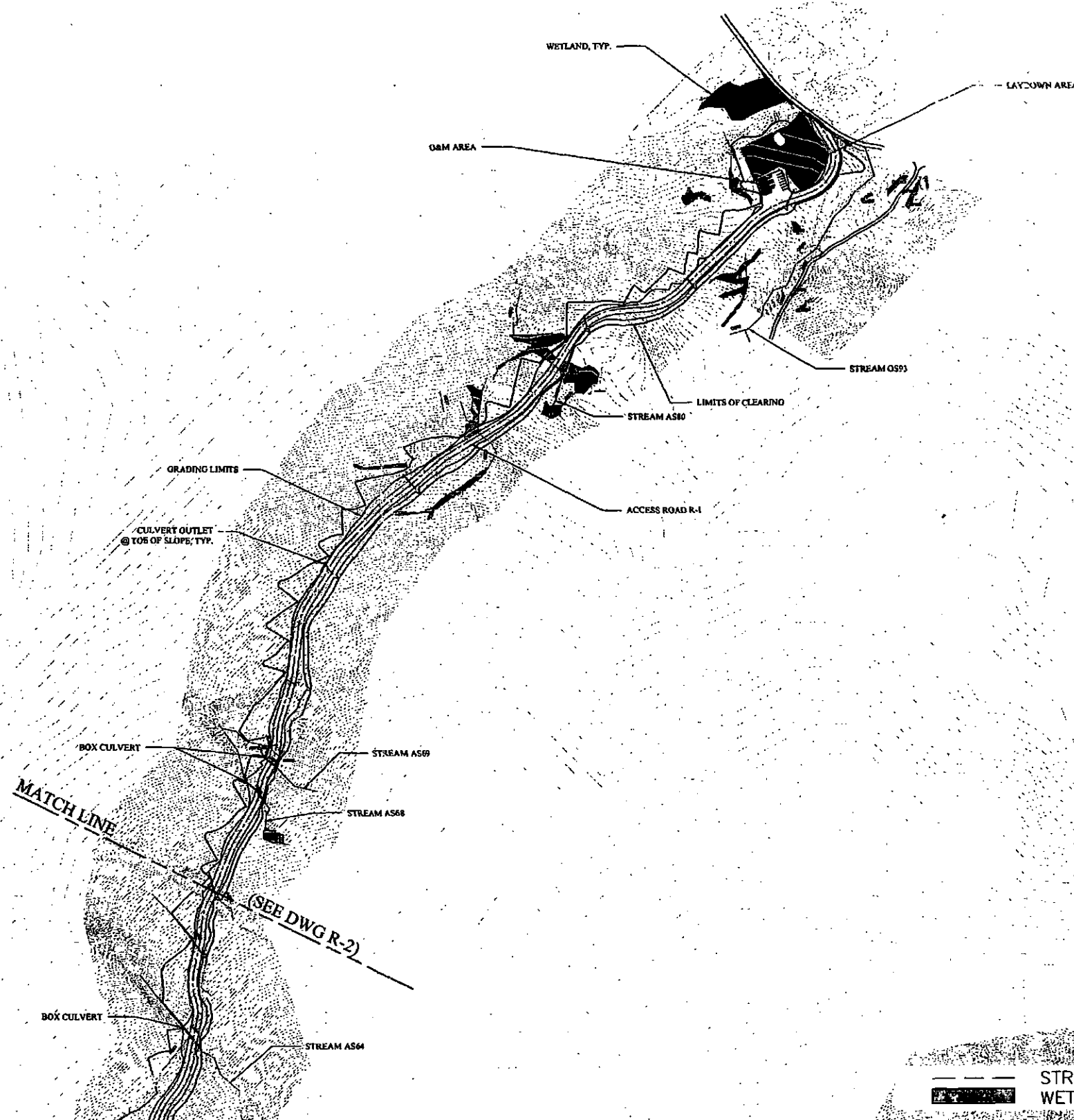
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TALLEY ROAD, BUCKLEY, MA 01501
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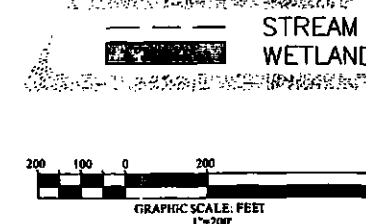
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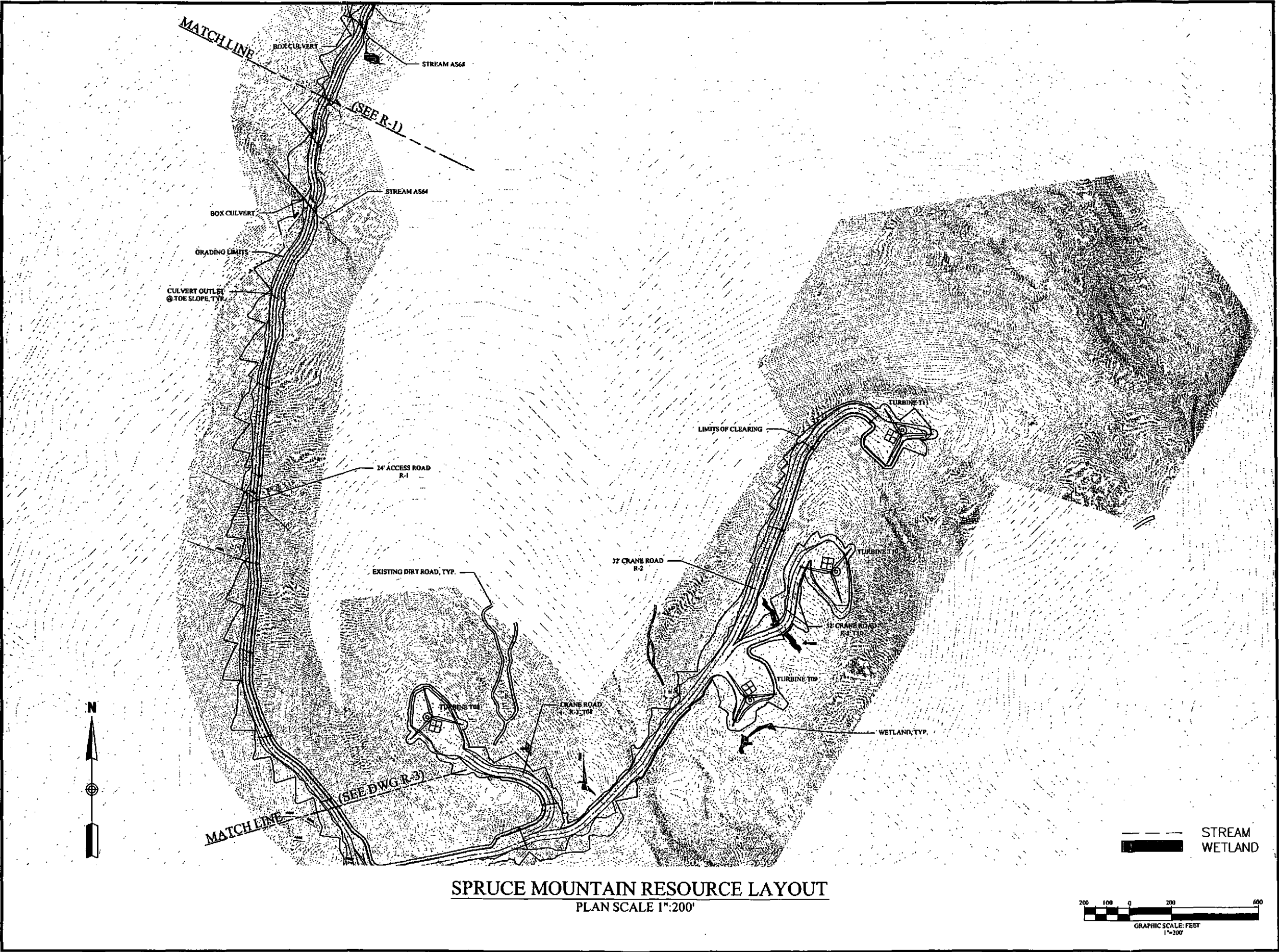
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Client: SPRUCE MOUNTAIN WIND, LLC	
Sheet Number: 1 of 6	

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SPRUCE MOUNTAIN RESOURCE LAYOUT
PLAN SCALE 1"=200'





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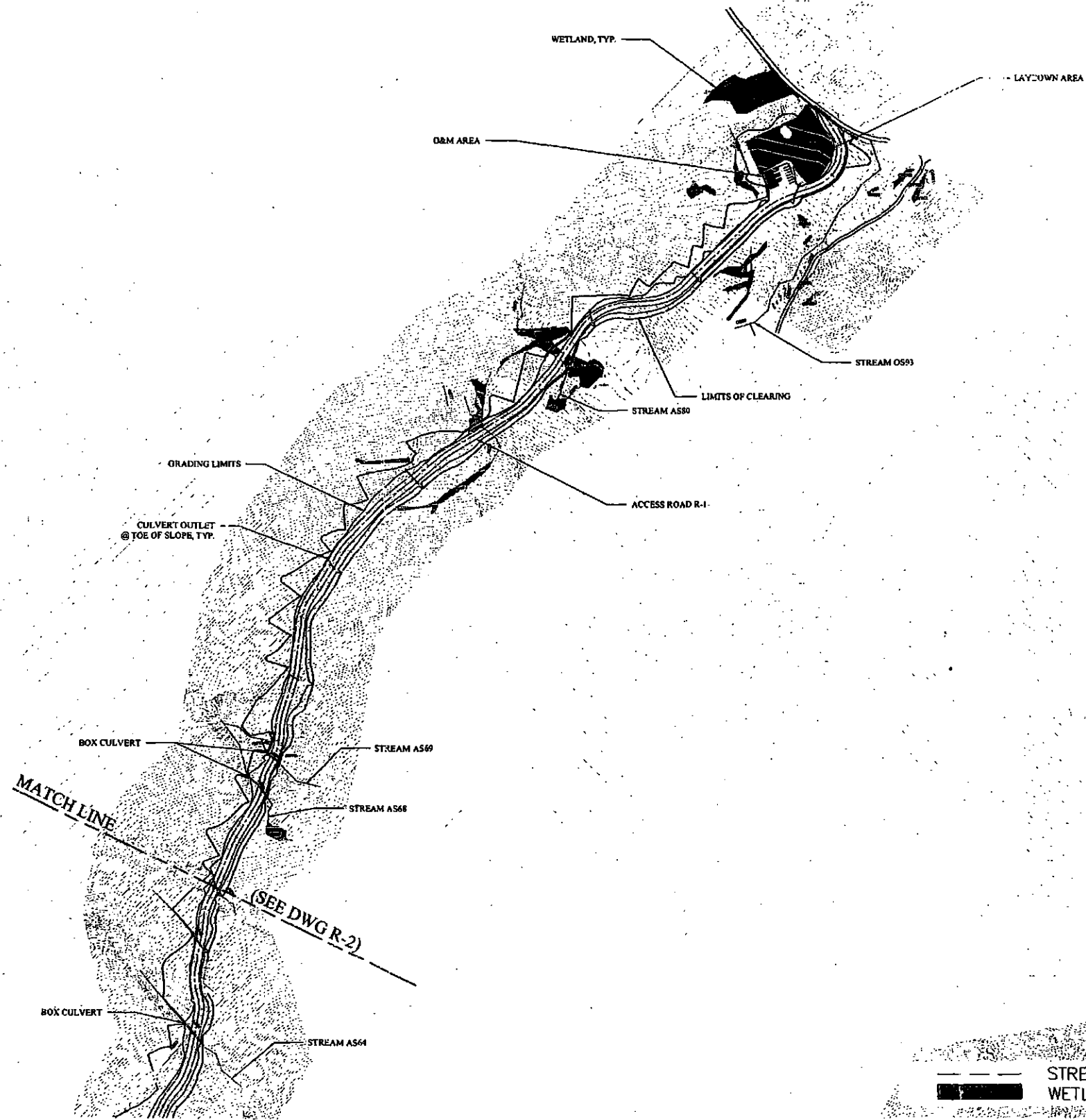
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1 ALLEN STREET, WOODSTOCK, ME 04090
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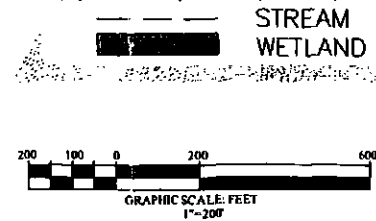
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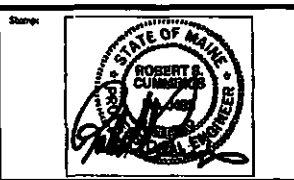


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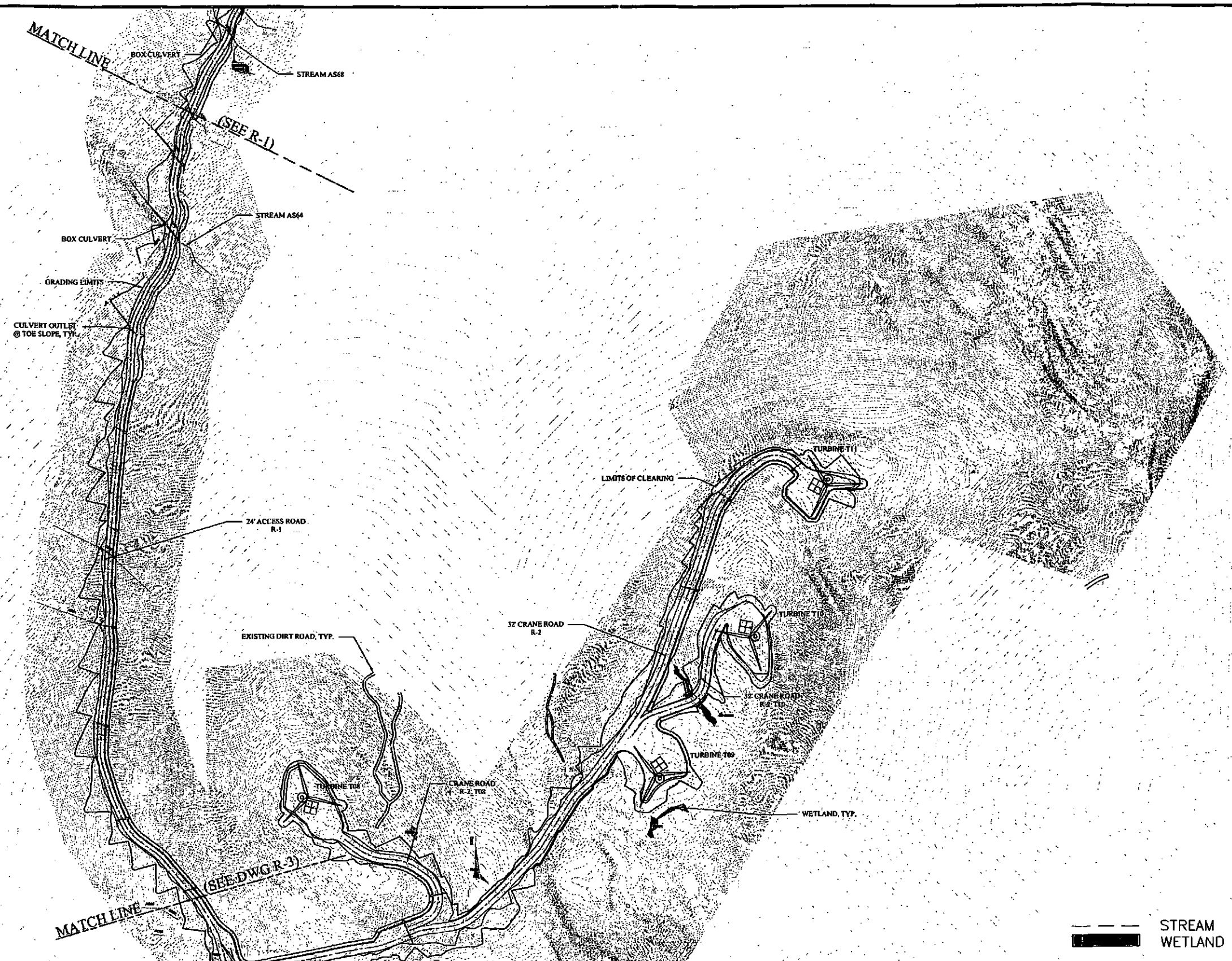


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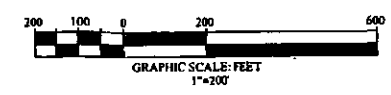
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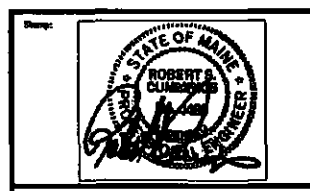


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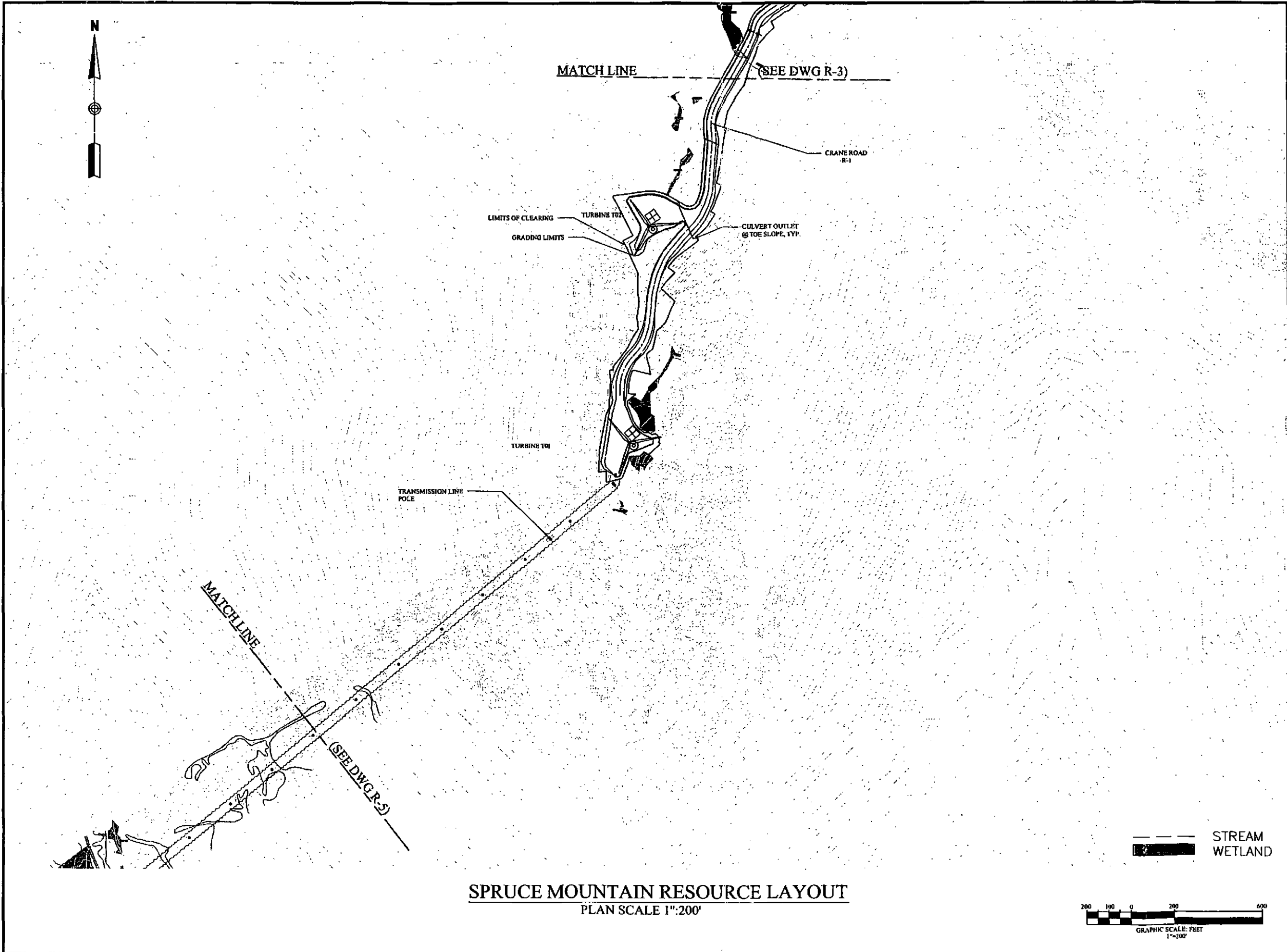
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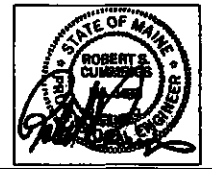
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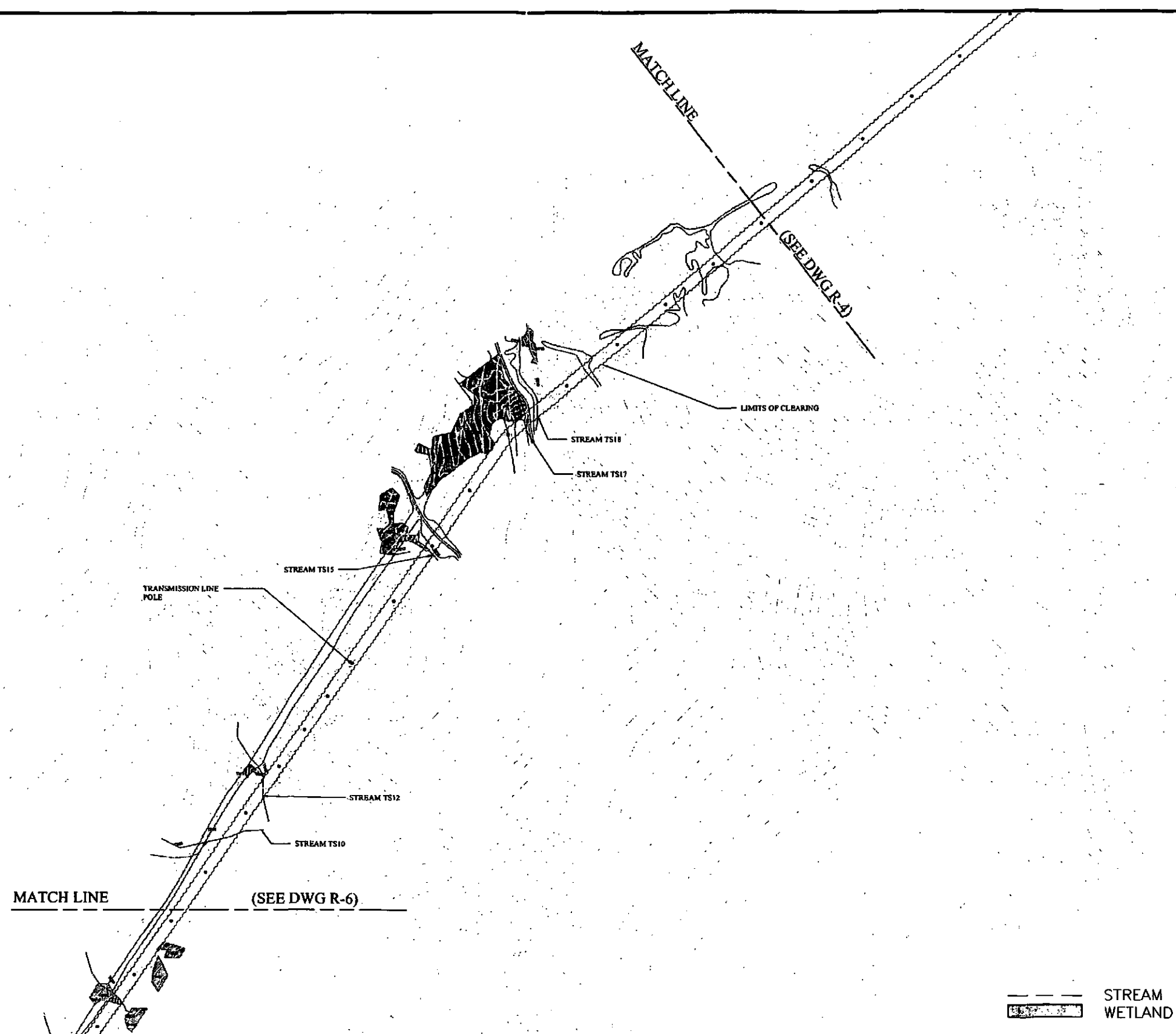


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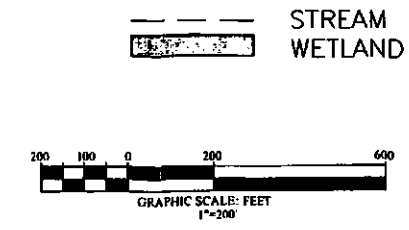
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R-4

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SPRUCE MOUNTAIN RESOURCE LAYOUT
PLAN SCALE 1"=200'



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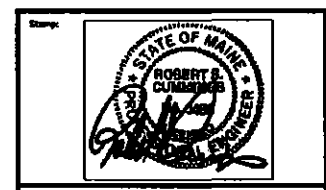
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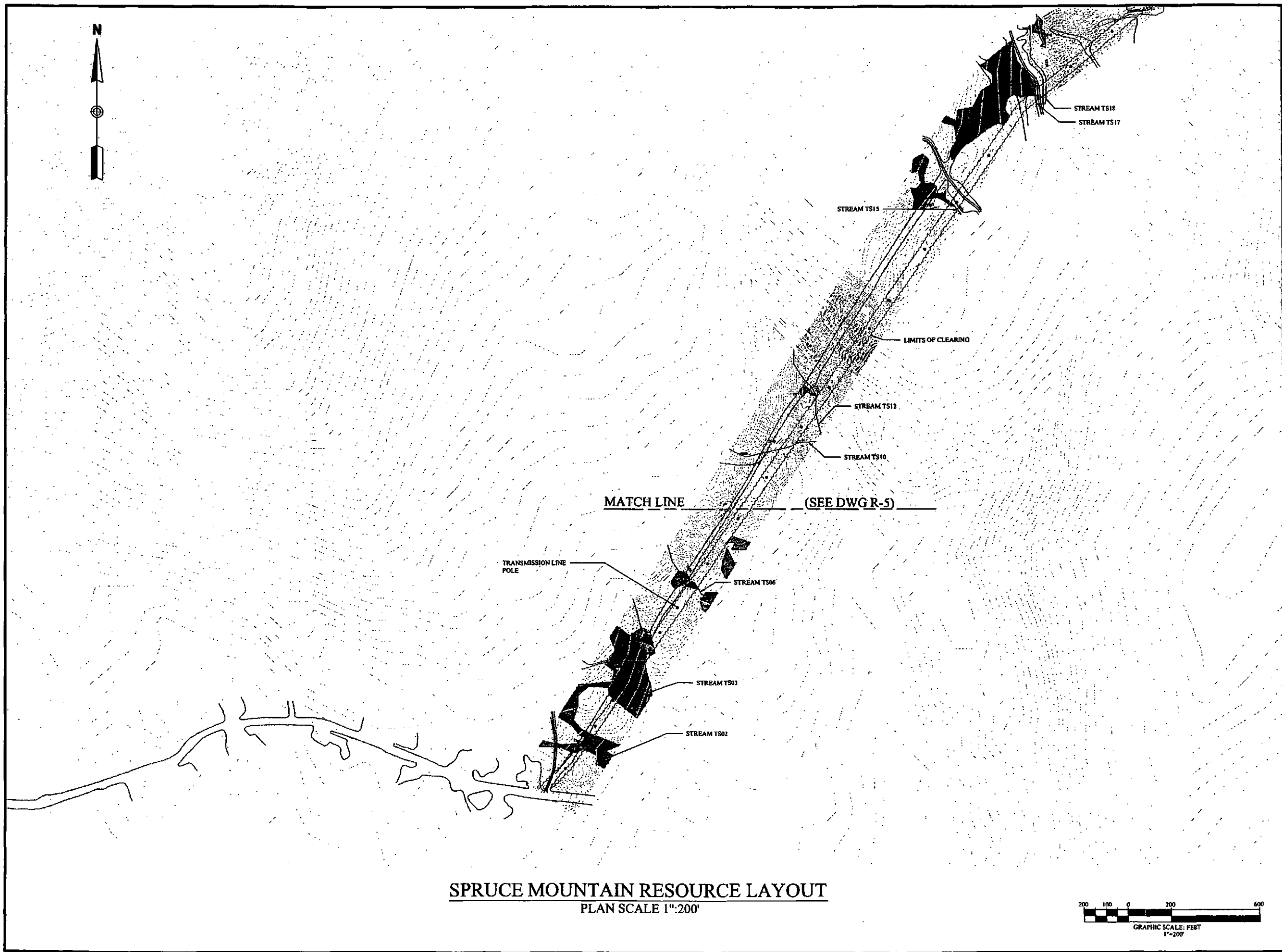
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Dwg No.: **R-5**



SPRUCE MOUNTAIN RESOURCE LAYOUT
PLAN SCALE 1"=200'

GENERAL NOTES:

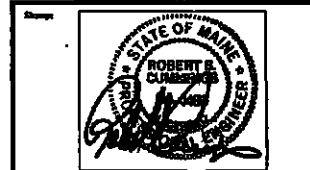
1. SCALES NOTED ARE APPLICABLE TO FULL SIZE (22"x34") DRAWINGS ONLY. SCALE REDUCED DRAWINGS ACCORDINGLY.
2. NORTH AS SHOWN HEREON IS REFERENCED TO GRID NORTH, NAD83, Maine State Plane, West Zone, US Foot.
3. ELEVATIONS AS SHOWN HEREON ARE REFERENCED TO MAD 83.
4. EXISTING TOPOGRAPHIC AND PLANNIMETRIC SURVEY INFORMATION AS SHOWN HEREON IS THE RESULT OF AERIAL TOPOGRAPHIC MAPPING COMPLETED BY PHOTOGRAMMETRIC TECHNOLOGY, INC. DEVELOPED FROM AERIAL PHOTOGRAPHY COMPLETED BY PHOTOGRAMMETRIC TECHNOLOGY, INC.
5. SOIL MAPPING AS SHOWN HEREON COMPLETE BY PHILLIPS ECOSERVICES.
6. ENVIRONMENTAL RESOURCE MAPPING (WETLANDS, STREAMS, VERNAL POOLS, ETC.) AS SHOWN HEREON BY TETRA TECH.
7. PROPERTY LINES AS SHOWN HEREON ARE THE RESULT OF ACTUAL SURVEY LINES SURVEYED BY KENNEBEC RIVER COMPANY, INC.
8. INVERTS SHOWN ON PROPOSED CULVERTS MAY BE ADJUSTED BASED ON FIELD CONDITIONS.

No.	Revision/Issue	Date
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PATRIOT RENEWABLES

EMS

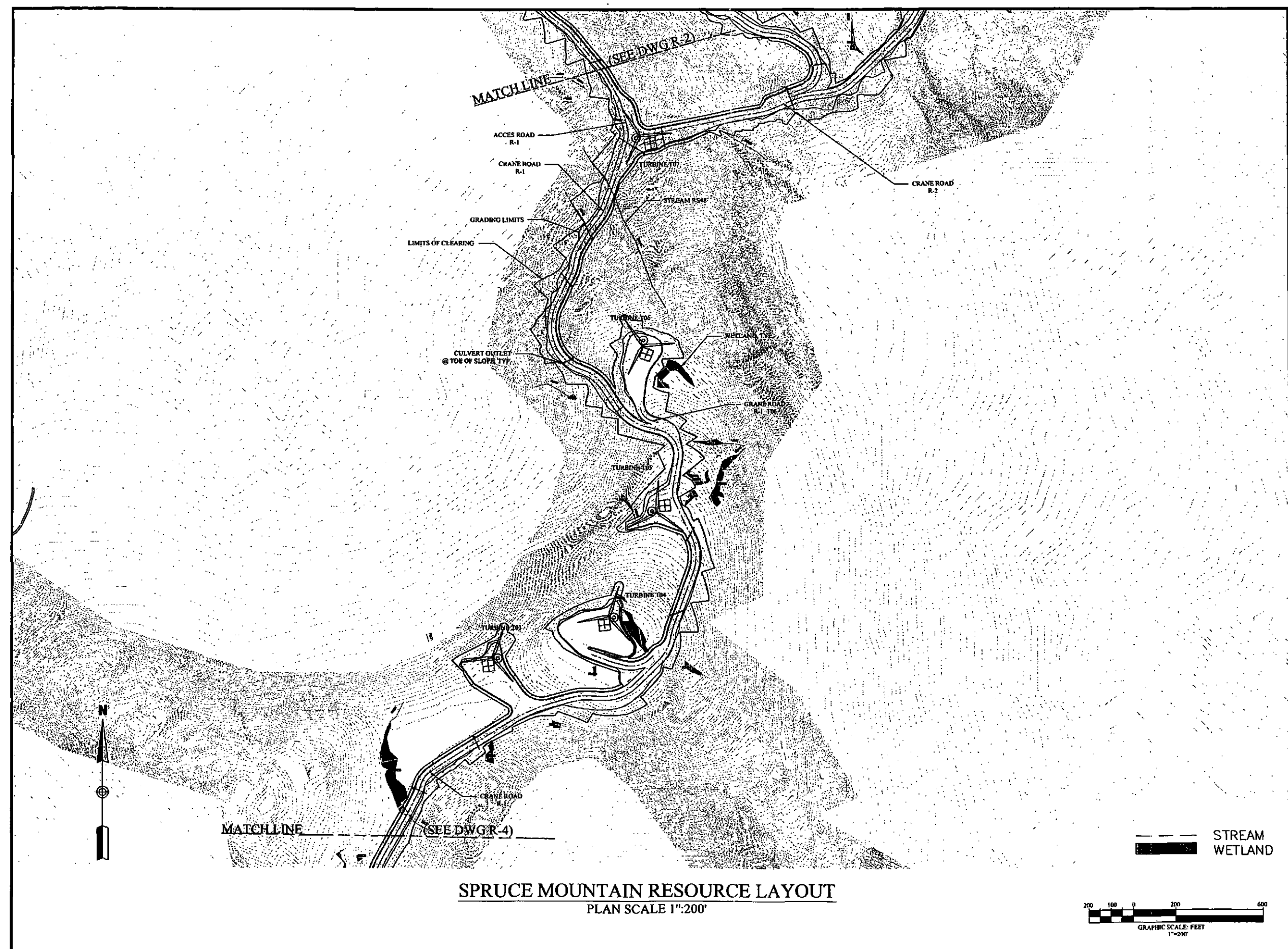
ENGINEERING & MANAGEMENT SERVICES, INC.
11 ALLEN ROAD, BOWDOENHAM, MA 01926
TEL: 978-942-1100 FAX: 978-942-1101



Drawing Title:
**SPRUCE MOUNTAIN
RESOURCE LAYOUT**

Date: 06/17/10	Scale: 1" = 200'
Drawn By: ACG	CHK'd By: RSC
Project: SPRUCE MOUNTAIN WIND PROJECT WOODSTOCK, ME	
Client: SPRUCE MOUNTAIN WIND, LLC	
Sheet Number: 6 of 6	

Dwg No.:
R-6



GENERAL NOTES:

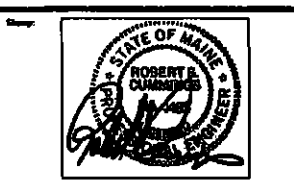
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No.	Revision/Issue	Date
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PATRIOT RENEWABLES

EMS

EMPLOYMENT & MANAGEMENT SERVICES, INC.
VALLEY ROAD, WOODSTOCK, MA 07195
TEL: 603-933-0000 FAX: 603-933-0001



Drawing Title:

**SPRUCE MOUNTAIN
RESOURCE LAYOUT**

Date:	06/17/10	Scale:	1" = 200'
Drawn By:	ACG	Check'd By:	RSC
Project:	SPRUCE MOUNTAIN WIND PROJECT WOODSTOCK, ME		
Client:	SPRUCE MOUNTAIN WIND, LLC		
Sheet Number:	3 of 6		

Dwg No.:

R-3

SPRUCE MOUNTAIN WIND PROJECT (SMW)

STATE OF MAINE

Department of Environmental Protection



DEP Application #L-24838-24-A-N/L-24838-2G-B-N

The following questions and requests are from the Department's meeting on March 25, 2010 and subsequent submissions as of September 15, 2010. Any questions that are received after this date will be addressed in the Department's licensing decision. The questions and requests that have been submitted are divided by topic and are in no particular order. This document will be posted on Department's website and distributed to interested parties.

WILDLIFE

Has there been research done on the effects of turbines on wildlife?

There has been about 20 years of research on the impact of industrial wind turbines on wildlife in Europe and the United States. Much of this is focused on mortality and/or influence on behavior of birds and bats. Of all bird families, passerines seem to be the most impacted by collisions with wind turbines in most study areas. Mortalities usually range from 0-5 mortalities/turbine/year, but there are sites where up to 30 mortalities/turbine/year have been documented. Bats appear to be impacted to a greater extent than birds at most sites. Mortalities range from .07-46 mortalities/turbine/year. The upper figure of 46 mortalities/turbine/year was recently documented at a facility in West Virginia. The Maine Department of Inland Fisheries and Wildlife's (MDIFW's) approach to minimizing impact of industrial wind turbines on birds and bats is to identify sites that have a high utilization by birds and/or bats. Though not fully understood, there can be significant variation on bird and bat use at different sites. Factors such as slope, aspect, local and regional topography, vegetation and proximity to migratory routes likely make some sites more attractive to bird and bats. Thus the first priority is to determine if the site proposed for industrial wind development is an area of high bird and/or bat use during any time of the year. It is also determined whether the site provides important habitat for any endangered/threatened or special concern species. This primary assessment is made through research on existing MDIFW records that may exist for the proposed site. This is combined with analysis of data collected by an environmental consulting firm, as part of the permitting process. This consulting firm, hired by the developer, works closely with MDIFW staff on designing survey methodology to collect statistically valid data on wildlife use during both the spring and fall seasons. The data collection includes avian radar surveys, raptor migration surveys, bat acoustic surveys, migrant stopover surveys and vernal pool and wetland delineation. Results of both the avian and bat survey data indicate the Spruce Mt. site is not a significant migratory route for either birds or bats. There is no habitat for Bicknell's Thrush on Spruce Mt. This bird is a species of special concern found at higher elevations in Maine. Other than the bat surveys, there were no other mammal surveys done at the Spruce Mt. site. Due to habitat present and location, Northern Bog Lemming and Canadian Lynx are not likely to occur at this site.

There is also a growing body of research on the impact of turbine generated noise on wildlife, but results are often inconclusive due to the large number of variables that need to be considered. Prior to looking specifically at noise from wind turbines, research had focused on noise generated from highways, military installations and other energy generation facilities. Noise generated by wind turbines could potentially interfere with intraspecific wildlife communication and/or predator evasion. The results of data are inclusive at this time, though I expect this topic will continue to be of interest as the development of industrial windpower sites increase.

Citations of research papers pertaining to wind power and wildlife can be provided upon request.

Will the wind turbines have a negative impact on game species?

Spruce Mt., in the Town of Woodstock, is within Wildlife Management District 12. The area supports a deer population within management goals of 10-15 deer/square mile. The undeveloped landscape around Spruce Mt. and a variety of upland habitat types provide good opportunity for deer, bear, moose and bear hunting. As stated previously, there is little conclusive data on the impact of industrial wind power on game species. Though there is much anecdotal evidence that many species of wildlife are quite resilient to noise and human caused disturbance, it is certainly possible that developed sites and those associated with noise may be avoided to some extent by some species. To complicate this, even individuals within the same species may have a differential response to the type of noise generated by the turbine. It is not MDIFW's area of expertise to predict how much noise will be generated at this site. It would largely depend upon the equipment chosen, orientation of equipment, local weather conditions and topography. Just as many species of mammals and birds can be found on busy road corridors and residential developments, MDIFW would expect many wildlife species on Spruce Mt. to adjust to noise and disturbance after a period of habituation. Some others may find factors associated with the site make the site less attractive; perhaps due to impaired communication or predator detection. Additionally, higher elevation areas away from public roads usually receive less hunting pressure than more accessible area. Based upon MDIFW records and two on site visits during the winter of 2009, there is not a Deer Wintering Area within or adjacent to the Spruce Mt. project site. There was consistent sign of moose along the summit ridge.

Will project fragment habitats?

Fragmentation of habitats occurs when roads, utility corridors, buildings, and parking lots break the natural landscape into smaller and smaller blocks. With fragmentation, the changes are usually permanent in nature. This needs to be distinguished from succession, in which a disturbance such as a wildfire or logging can "reset" the cover types. This type of habitat change is temporary in nature and will usually mature through a progression of cover type stages, each of which provides habitat for a variety of species. It is likely that the development of the Spruce Mt. site will result in permanent modification of the ridge to accommodate the 10-11 concrete foundations for the turbines, 7,200 ft. access road to reach the ridge, 11,300 ft. access road to maintain the turbines and a new 6,890 ft. utility corridor to carry power to existing power lines on the Cushman Rd.

The impact of this project to Spruce Mt. itself would be significant. It is currently undeveloped. Based upon the forest types present, it appears at though both the lower slopes, comprised of young northern hardwoods and the summit ridge, dominated by even aged spruce, have been harvested in the recent past. Given the scale of this project, it is not likely to pose a major contribution to large scale, regional fragmentation. The habitat types impacted most by the project are not rare or unusual. Nonetheless,

modifications to undeveloped ridges would contribute more to fragmentation than a similar scale project in an agricultural or suburban landscape. Though 10-11 turbines are currently proposed for the Spruce Mt. site, at a maximum rated capacity of 2 megawatts per turbine, it is a goal to have 3,000 megawatts of electrical generation through wind power by the year 2020. It is important that we consider the cumulative impact to habitat fragmentation if this goal is achieved.

Federal Government requires 3 years of avian studies – what about the state?

It is MDIFW's understanding that the USFWS concurs with the MDIFW requirement of two seasons of pre-construction surveys – Spring and Fall. These would include avian and bat radar, bat acoustic, raptor surveys, migrant stopover and breeding bird surveys. Post-construction survey methodology is currently being discussed. It will include an approved methodology to search for bird/bat mortalities and/or compliance with turbine operation Best Management Practices. In either case, if there is a significant impact on wildlife, there will be provisions for adaptive management of the facility.

For questions specific to the USFWS, interested parties can contact the Orono Field Office at 827-5938. They have recently published their Wind power Guideline Recommendations to the Secretary of the Interior. It can be found at: www.fws.gov/.../windpower/wind_turbine_advisory_committee.html

Will project meet USFWS Guidelines?

The Guidelines referred to can be found at the above link. The guidelines follow a five tiered approach of initial consultation with state/federal agencies and then following progressively more detailed studies so long as the project remains biologically feasible. If there is unreasonable impact to habitat or wildlife at any tier, the permitting process would not proceed to the next tier and the site would be dropped from consideration. Both USFWS and MDIFW are in agreement that proper siting of these facilities is critical. There is still much work needed to determine all the factors that influence when impact to a species is unreasonable, when taken in context of a population.

Are there Deer Yards on the parcel? Lynx?

Based upon a review of MDIFW current and historic data and two site visits to the project site during wintering conditions, there are no known deer wintering areas on the project site. No formal surveys have been done for lynx on Spruce Mt. This site is considered outside the known species range of Lynx in the Northeast.

Are there vernal pools? What will be the impacts to vernal pools?

There were no significant vernal pools found on the Spruce Mountain site.

Have the federal trust fish, wildlife and their habitats been protected? Have the guidelines in the U.S. Department of the Interior Guidelines been met?

Wildlife and wildlife habitats regulated by federal law will be adequately protected. With respect specifically to eagles, there are no eagle nests in the immediate vicinity of the project site, and no unusual activity or use as documented in the raptor surveys that were submitted.

Did the bird study only include migrating birds and bats, or did it also include year round birds?

The applicant's study included avian and bat surveys during the spring migration, summer residency and fall migration period of 2009.

STORMWATER/EROSION

What will be the width of the access road and what is the width of the crane?

The access road will be initially constructed to accommodate the width of the crane (30 feet). It will have a travel surface of 32 feet. After turbine construction, it will be reduced to 12 feet wide and will include a couple of turn-outs for safety purposes.

Will the water quality of the nearby ponds be affected by the construction of the wind turbines?

The project includes an extensive erosion and sediment control plan and the Department will require a third-party inspector to be on site on a regular basis to ensure that erosion controls are in place and functioning and properly maintained throughout project construction. Any documented discharge to a waterbody is a violation that the Department will enforce.

SOILS, BLASTING, AND GROUNDWATER

Isn't 2000 ft way too close to existing structures to allow blasting? Shouldn't it be in the neighborhood of a mile back like other communities?

It does not appear that there are any structures or wells within the pre-blast survey area of 2,000 feet from blast sites. Pre-blasting surveys of structures within 2,000 feet is an industry standard; blasting is routinely done closer than one mile for a variety of projects.

If a landowner's well is damaged, shouldn't they be compensated or indemnified? Given adequate drinking water doesn't seem like a reasonable indemnification to someone who has lost use of their well.

Spruce Mountain Wind will do a pre-blast survey of all structures and wells within a 2,000-foot radius of all blasting areas. All property owners with an active well within the pre-blast survey area will be offered a water quality test prior to the start of blasting activities. Studies have shown that significant fracturing of the rock around a blast site is generally limited to a distance of 20 – 40 blast hole diameters.

What about water quality? Not just the function of the well, but the actual quality of the water? Isn't it possible for residents much farther then 2000 feet have the quality of their water negatively affected? Is there a plan to test well water before and after the project is constructed?

Damage to wells can occur when the excavation is done without provisions to maintain the natural hydrology. This wind development (and all of the others reviewed by the Department) will be/are required to make provisions to prevent harm to groundwater supplies down gradient of the development area.

What about the use of pesticides or chemicals for dust control?

Spruce Mountain Wind will not use pesticides or other chemicals to control dust. Water will be used.

Will there be excavations all the way to deep bedrock? Will the excavation change the groundwater table?

Maintaining the natural hydrology is a primary concern when reviewing high elevation development projects. The State's soil scientist reviewed the application and provided a critical analysis regarding maintaining the natural hydrology. Special techniques have been developed and used on previously-approved wind farm projects to accomplish the goal and have proven successful. In particular, the rock sandwich (a layer of crushed rock sandwiched between two layers of filter fabric installed at the base of roads) has been effective at maintain natural hydrology in high-elevation locations.

Could veins with minerals be opened up to contaminate the groundwater? Shouldn't more soil samples be taken?

The soils on Spruce Mountain have been very carefully studied by soil scientists and a soil map has been produced to indicate the variability of conditions for reviewers. Many soil pits and auger borings were observed to produce the soils maps. With this information, as well as input from the State's soil scientist, the Department was able to review the project to assure it will be constructed to minimize any alteration of the natural hydrology (surface and groundwater). The Department is not aware of any soils in Maine that have veins that may be opened up and become conduits for groundwater contamination. That happens sometimes in other states where limestone deposits exist but we have very little limestone in Maine soils. They are usually quite acidic.

Won't area wells be affected?

The Department will examine area wells, types of rock at the site, and blasting, and has extensive experience with similar quarry projects and the use of explosives.

Will blasting affect wildlife, resources and the mountain?

Blasting that is conducted must be done in accordance with the Department standards. The blasting plan will be consistent with those standards. Blasting conducted in accordance with those standards will minimize the risk of adverse impact on resources and off-site properties. It is necessary for the blasters and drillers to cooperate effectively, since there are zones of softer rock, as shown in the core logs that will need to be addressed properly during shot design in order to minimize the risk of flyrock and air overpressure.

Blasting and access road construction could change spring water flow patterns and negatively affect downstream water bodies. What investigation has Patriot done to address this issue?

The Department is requiring that the access road be constructed using rock "sandwiches" in key locations; these are layers of large blasted rock laid beneath the road to ensure that natural drainage is maintained as "sheet" flow. This technique has been used in other projects on mountain sites in Maine with success.

SURFACE WATER

Since the turbines will need a considerable amount of concrete for the foundations, and that is I believe 11 foundations, what effects will the pouring of that concrete have on the resources around? The turbines will be at the highest possible points to harness power from the wind and any overflow will certainly run down and into the water table and into waters such as Concord Pond. Can the state justify potentially polluting land & water for such a project?

Concrete will be poured into forms for each of the 10 turbine sites and the forms will remain on until it has properly set. Cleaning of all tools and equipment will be done at least 100 feet away from any streams and waterbodies. The Department does not anticipate a water quality problem either on site or off site as a result of the use of concrete associated with the construction of the project.

Will the Department impose timing restrictions for stream crossings?

Any in-stream work must be done between July 15 and October 1. During the construction of the access road, the applicant proposes to span the streams, and avoid disturbing the stream channel and its banks, by installing arch culverts. In order to construct the transmission line the applicant will utilize timber mats to span the stream. The use of arch culverts and other construction methods (timber mats) that do not impact the stream channel will not be subject to the timing restriction.

Was DEP able to visit the ponds where Maine children spend their summers swimming? It is important that the water be tested before and after the blasting and clear cutting to ensure that there is no change to the water quality. What about silt, metals, lead, sulfur, arsenic, etc. in the water? Andrews Brook, Beaver Brook and natural springs are in the area.

Department staff visited a number of the ponds in the vicinity of Spruce Mountain to evaluate the potential visual impacts from the project. Spruce Mountain Wind will be required to adhere to a stringent stormwater management and erosion control plan designed to protect the water quality of down gradient ponds and other surface waters.

Are buffer areas utilized as stormwater filtering devices? How is the handling of tree removal in buffer areas developed? How much would a buffer area have on logging operations within steep areas? How much larger would a buffer area be due to increased gradients? Are these buffer areas marked by a land surveyor?

Stormwater buffers are often utilized on wind turbine projects and are incorporated into the design for Spruce Mountain. They are required to meet the standards outlined in Chapter 500 of the stormwater management rules with respect to slope limitations and permanent markers on the ground with survey pins or signs. Buffers cannot be cut or logged, with the exception of forested, limited disturbance buffer in which some tree removal is allowed but no cleared openings. The Department recognizes that excessively steep areas are not suitable to act as buffers and the stormwater regulations take steepness into account.

NOISE

Will a baseline study, post-construction and periodic noise checks in dBA and dBC be done? Will there be sound testing before and after these turbines are erected to ensure the noise levels will be within the DEP's acceptable limits? One residence will be approximately 2,000 feet away from the

wind turbines. How can the DEP be certain the sound levels at this residence will not be over the applicable limit without proper pre-testing?

Baseline, or pre-construction noise levels, have been submitted in the application as pre-development ambient sound levels. All proposed projects subject to Site Location of Development Act standards are required to meet the noise limits as outlined in Chapter 375.10, which are based on the A-weighted scale. As a condition of approval, most wind energy developments will be required to implement a sound level compliance assessment plan. The terms of this plan would be determined by the Department with assistance provided by the Department's 3rd party noise consultant.

How do we prevent problems occurring at other wind sites such as Mars Hill?

The Mars Hill project was determined to be in compliance with the 50 dBA requirement as authorized in its permit. All pending and future wind developments are or will be required to complete a much more conservative predictive model and be further constrained by the most conservative sound level limit (45 dBA), which is at least 5 dBA less at the nearest protected locations than approved at Mars Hill.

Does DEP have stricter regulations now than were imposed at Mars Hill?

The noise regulations are the same. Mars Hill applied for a variance from the noise limit and that variance was granted. The SMW model is more conservative and no variances are being requested.

The CADNA/A model with point sources is inadequate – why doesn't the DEP require a line source analysis? (BB)

The Department's noise expert has examined this issue thoroughly and concluded that point source (spherical wave fronts) models appropriately represent sound pressure levels (LAeq), tonal and short duration repetitive sound (SDRS) for the proposed wind turbine project within the region of the Department's compliance. Perpendicular to a linear segment of turbines there is a region where the cumulative effect can be approximated by a line source (readily observed from the applicant's submissions).

Why is the noise analysis based only on existing homes and not on land only?

The model requires that noise be analyzed at protected locations. Protected locations are defined in Chapter 375 (10) as "Any location, accessible by foot, on a parcel of land containing a residence or planned residence or approved residential subdivision, house of worship, academic school, college, library, duly licensed hospital or nursing home near the development site at the time a Site Location of Development application is submitted. . ."

Considering the location of the turbines, and how pristine the location(s) are, can any noise be justified in actuality? The turbines themselves may not generate any noise once construction has been completed, but the noise consideration is before completion.

Chapter 375 has provisions for "quiet areas," within which the noise limits are reduced during both daytime and nighttime hours. The SMW model has provisions to meet the quiet area limits.

Won't gear driven turbines become noisy as they wear down?

Modern wind turbines are equipped with sensors designed to identify such issues and are regularly inspected by operating personnel to avoid excessive wear and subsequent damage.

What kind of sound modeling software was used by Patriot and what is the margin of error on this software?

The wind project prediction model is based on CADNA/A software, ISO-9613-2 algorithms and the following prediction assumptions:

- Omni-directional downwind propagation
- All wind turbines operating at maximum sound power levels concurrently
- Manufacturer specifications + 2dBA (IEC 61400-11)
- Current, warrantied Gamesa G90 maximum sound power output 105.0 dBA (previously 105.3 dBA)
- Ground absorption factor of $G = 0.5$
- Foliage effects (not included)
- Application of a 3dBA safety factor to nearby protected location region
- Spherical divergence from hub level point sources
- Atmospheric absorption (10° C 70% RH)

Incorporation of an uncertainty factor of + 5 dBA for maximum equipment specification potential variability under stable atmospheric conditions and measurement methodology uncertainties results in a reasonable prediction model that may be conservative at times. There isn't a "margin of error" in the model in the sense that there might be for other computer modeling. The Department and its expert believe that the +5 dBA uncertainty factor is sufficiently conservative.

Shouldn't all residences in Woodstock be considered "protected areas" which allow for a 45 dBA nighttime average noise level? Shouldn't people be allowed outside of their houses at night? Why would Patriot be allowed to have a 50 dBA noise level at a property line? Is a second acoustic modeling planned by an unbiased third party?

Protected areas are defined in Chapter 375 (10). Chapter 375 (10) also allows the applicant to either meet the Department's noise standards at either the property boundary or 500 feet from a protected location. The applicant chose to meet the standards 500 feet from a protected location. The Department will not require a new acoustical model to be completed by an independent third party. Instead the Department hired an expert to evaluate the applicant's model. That expert commented and asked the applicant to build in an additional safety factor (see question above).

What is the distance from a turbine to the nearest receptor, in feet? Where the residence in relation to the property boundary and what is the name and address of the owner of the receptor site?

The nearest receptor, a seasonal camp, is located approximately 2,150 feet to the nearest turbine. Owner information can be found in the abutter report of the application under public notice.

The project will generate low frequency noise which will create negative health effects.

Chapter 375 noise standards of the Site Location of Development Act were developed through a stakeholder process to conform to the commonly accepted (A-weighting scale, also known as dBA) industry standards for sound level measurement. The dBA scale is widely used in noise ordinances, equipment specification, and sound control regulation.

The Department's noise expert commented that infrasound, sonic frequencies less than 20 hertz (Hz), have been widely accepted to be of no concern below the common human perception threshold of 85-90 dBG for non-pure tone sounds. There is insufficient, broadly accepted evidence to conclude otherwise. Numerous national infrasound standards limit industrial facilities, impact equipment and jet engines, but wind turbine infrasound levels fall far below these standards.

Wind turbines rotating under conditions necessary for power production produce a measurable broadband (lower frequencies) amplitude modulation of sound ("swoosh" and/or "thump") at ± 1 Hz, which is not the same as infrasound. The introduction of C-weighting for the assessment of wind turbine sound is preliminary and unrefined on a broad basis. Current international wind turbine acoustic output standards do not require dBC or dBG rating.

Were the sound engineers employed by Patriot using standard instruments to measure sound levels in the normal range that the human ear detects most easily?

No sound measurements have been required by or reported to DEP by the applicant. Any future measurement instruments will be in compliance with the requirements of Chapter 375.10(H) (2.2).

Noise: would like a base line study, post-construction and periodic checks. Both A & C dba's

Baseline studies are not required by Chapter 375 (10), but post-construction compliance measurements are (as specified in Part C). The Department will require the applicant to periodically monitor the noise at specified compliance locations and to submit that monitoring to the Department for review.

How do we prevent the same noise problems that are occurring at other wind sites?

Using Mars Hill as a comparison:

Mars Hill Wind Project	Spruce Mountain Wind Project
Increased sound level limit (50 dBA)	Most conservative sound level limit (45 dBA)
ISO 9613-2 standard prediction method	ISO 9613-2 conservative prediction method
IEC 61400-11 average turbine specification	IEC 61400-11 average turbine specification plus uncertainty factor or equivalent

The Spruce Mountain Wind project was required to complete a much more conservative predictive model and was further constrained by the most conservative sound level limit (45 dBA), which is at least 5 dBA less at the nearest protected locations than approved at Mars Hill.

Were the sound engineers employed by Patriot using standard instruments to measure sound levels in the normal range that the human ear detects most easily?

No sound measurements have been required by or reported to the MDEP by the applicant. Any future measurement instruments will be compliant to the following requirements Chapter 375.10 (H) (2.2).

In Reference to: MA. Dr. Swinbank's January 5, 2010 written letter to the Michigan Public Service Commission, the following are in response to the references and conclusions:

- *Inflow atmospheric turbulence and wind gradient effects on wind turbine noise levels-- ref [1 & 2]*

The Department recognizes that the effects of atmospheric inflow characteristics include atmospheric turbulence, wind gradients and temperature inversions, which can increase noise levels associated with wind turbines and consequently requires the predictive model and operational compliance testing be evaluated during these conditions.

- *Finally, they measured in practice the low-frequency threshold of hearing under laboratory conditions for persons subjected to impulsive wind-turbine noise, and showed this could be almost 20dB lower (i.e. more sensitive) than the conventionally accepted noise threshold for less obtrusive sounds-- ref [3]*

The low frequency impulsive wind turbine noise addressed in Dr. Shepherd's testing arose from older downwind wind turbines with very prominent fundamental frequencies of 0.5-1 Hz. The Gamesa G 90 proposed for the Spruce Mountain Wind Project (SMWP) is an up wind unit not characterized by comparable prominent fundamental frequencies.

- *... den Berg (2004, [4]) ...has shown that wind gradients can increase sound levels at night by up to 15dB*

The Department recognizes that nighttime stable atmospheric conditions including wind gradient and temperature inversions can substantially increase noise levels associated with wind turbines and consequently requires conservative predictive model assumptions and operational compliance testing during worst-case conditions.

- *Wind turbine noise is very much more annoying and intrusive than the criteria set by conventional EPA considerations—ref [5]*

Studies appear to be as yet preliminary due to confounders that may include visual factors and attitudes toward the impact of wind turbines on the landscape, etc.; studies do not use control groups and do not assure a direct correspondence to siting conditions for a generalized setting. "Wind Turbine Sound and Health Effects an Expert Panel Review" (AWEA/CWEA 2009)

- *But although explicitly cited, there is nothing in the actual content of this report that even begins to reflect the extremely important information that these references describe. A casual reader would be misled into thinking that they have been taken into account, but there is no evidence that their content has been absorbed. —ref [6]*

The Department's expert disagrees with Dr. Swinbanks' conclusion. The Michigan Land-Use Guidelines For Siting Wind Energy Systems States, (*emphasis added*) "The new guidelines are meant to help local officials strike a balance between the need for clean, renewable energy resources and a local government's responsibility to protect the public health, safety and welfare... Local officials can expect ... difficult data Interpretation issues to arise, and it is a very challenging job. Despite these

challenges, a thoughtful review of the science, engineering and field experience behind wind energy is required of local land use officials who want to take a fair and objective look at the issues. Field studies are needed to investigate the impact of wind turbines on people living in their vicinity (Pedersen and Waye, 2004; van den Berg, 2004). **This is a new and active area of research.** Scientists held the **first** International Conference on Wind Turbine Noise in Berlin in 2005, and a **second** international wind turbine noise conference will be held in France in 2007, organized by the Institute of Noise Control Engineering. **Local decision makers currently find themselves in an awkward position — without a scientific basis for their judgments about noise effects. And because noise is generally defined subjectively as “unwanted sound,” scientific studies might never be conclusive. Noise is a subjective judgment —”**

TANGIBLE BENEFITS/ECONOMIC FEASIBILITY

There will be no local benefits. All of the power will be transmitted to Massachusetts.

Although the power generated by the project will not be purchased by people that live near the project, there's a very good chance some of it will be used by them. The power from the project will be transmitted to the 34.5 kV bus at the nearby Woodstock Substation, where it will flow through both the high voltage transmission system and the local distribution system. Electricity flows like water. Once it enters the grid it will move to, and be consumed at, the closest source of demand, which is usually local, depending on usage. No matter who eventually purchases the electricity produced by the project, which is really just accounting procedure, all of the power will be bid into the real-time or day-ahead markets at the local node at a cost of \$0 or close to it (because there is no fuel cost). Although the project usually gets paid more than its bid price (due to electricity market structure), this low bidding usually has the effect of lowering electricity prices in the project area.

TITLE, RIGHT, OR INTEREST

Has the land been acquired by Patriot Renewables?

Jay Cashman, principal owner of Patriot Renewables, will own 1,340 acres of site with easements on the remaining 1,539 acres.

Are there easements for the power lines or have they found an alternative plan? How can the DEP approve a project that will have to reroute the electrical part of the project to get its power tout to the power station?

The applicant is proposing to construct the transmission line down the mountain to the road right of way and CMP will construct, or reconstruct, the existing transmission line that runs along Cushman Road to the Woodstock substation.

ELECTRICAL INFRASTRUCTURE

Will local rate payers be paying for the increased distribution cost?

No.

Was the DEP able to visit the residents on Cushman Road who will be giving up their front yards for an elaborate electrical infrastructure? Have these residents been protected from the high level of electricity that will be flowing across their properties?

While there is no documented evidence of the "high level" of electricity emitted by the existing or proposed transmission lines, the line upgrade is not part of the current application. Department did not specifically view the existing transmission line site.

DECOMMISSIONING PLAN

There is no plan for decommissioning. Commentor would like decommissioning costs bonded and an escrow account created from Day 1 of operation. The salvage values have been overestimated. Does Patriot Renewables have a specific decommissioning plan for the Spruce Mountain Wind project?

The applicant's decommissioning plan is summarized in the table below. The decommissioning fund will be fully funded by year 13 of operation. Salvage values are calculated using actual turbine component weights and composition and current local market prices minus breakdown and transportation costs. Salvage values will be recalculated every time the decommissioning costs are reassessed in the table above. As a requirement of submittal of a Site Location of Development Act application, the applicant must estimate and provide for the total cost of decommissioning less salvage value of the equipment. The applicant's decommissioning plan meets this requirement.

Year of Operation	Financial Assurance Level % of total project Decommissioning costs	Reassess Total Project Decommissioning Cost at end of period
1 - 3	20%	-
4 - 6	40%	Yes
7 - 9	60%	-
10 - 12	80%	Yes
13 - 15	100%	-
16 - 18	100%	Yes
19 - 21	100%	Yes
21 end of life	100%	Every year

VISUAL IMPACTS

Both Bald Mountain and Speckled Mountain were purchased with money from Land for Maine's Future funds. It's our opinion that the public purchased this land and it should not be subject to views of wind turbines. There are six lakes in the vicinity that are in the Maine's Finest Lakes study. DEP should protect Maine's special places.

Pursuant to 34-M.R.S.A. § 3451 and 3452, the applicant conducted a visual impact analysis on all scenic resources of state and national significance. This analysis included discussion of potential impact to the 66 great ponds identified in a report entitled "Maine's Finest Lakes" published by the Maine State Planning Office (SPO). SPO commented that 35-A M.R.S. §3451(9) defines "scenic resources of state or national significance" as including a "great pond that is one of the 66 great ponds located in the State's organized area identified as having outstanding or significant scenic quality in the 'Maine's Finest Lakes' study published by the Executive Department, State Planning Office in October 1989." Six ponds in the vicinity of the project are on the Maine's Finest Lakes Study list: Abbotts Pond, Little Concord Pond, Shagg Pond, Labrador Pond, Little Labrador Pond and Joes Pond. The project will not be visible from Little Labrador Pond or Joes Pond. The visual analysis included photosimulations of the views of the project from these lakes and from Bald Mountain and Speckled Mountain. Department staff visited the project area during the review of the project. The Department retained an independent visual expert to review the application and comment on the anticipated visual impacts. The expert concluded that the potential scenic impacts of the project would be reasonable.

Considering the spectacular views from the top of the mountains, and with the precedents set by the DEP in approving road building to access such mountaintops, why wouldn't developers seek to piggyback upon this to create the ultimate view lots?

In the event that a developer wants to develop the site of a wind facility, after decommissioning, into a residential subdivision, they would be subject to the standards of the Site Location of Development Act as it relates to visual impacts. Although the main access road would be there, if the Site Law is triggered, lot development would need to be evaluated by the Department.

SHADOW FLICKER

The effects of shadow flicker can drive people crazy.

The applicant submitted the results of a shadow flicker analysis done in accordance with Department rules. There will be some shadow flicker effects off the property either owned by the applicant or on which the applicant holds an easement; however these impacts are well below accepted tolerance levels.

DEPARTMENT PROCEDURAL QUESTIONS

Can we be included in the list of interested parties? Will a draft order be issued? Will the Department accept comments from interested parties on the draft order?

You will be included in the list of interested parties for this application and a draft order will be issued. You will be afforded time to comment on the draft order in accordance with the Department's Rules.

Is an Army Corps of Engineers permit required for this project?

Yes.

Is a Certificate of Public Necessity from the Maine Public Utilities Commission required? How is CMP involved?

A PUC certificate is not required for this project or for the electrical transmission line upgrade. The project will connect into the existing infrastructure owned by CMP.

How would a local ordinance differ from the Department's regulations? Are there other towns with local ordinances that apply to wind power projects?

A local ordinance can differ in a number of ways from the Department's regulations and they can be either more or less stringent. If the activity or development is regulated by Department, however, the stricter Department rules would apply. The Department is not aware of towns in Maine that specifically regulate wind power projects.

PROPERTY VALUES

Will the project lower the property values of undeveloped parcels in the project vicinity?

The Department does not have jurisdiction over issues of property values. Therefore, the Department does not have authority to use a perceived negative impact on property values as a basis for determining if permitting requirements have or have not been satisfied for any particular project.

TOURISM

How will the project affect tourism? Attendance of state parks and campgrounds was up approximately 10 percent in 2009.

The Department does not have jurisdiction over the matter of tourism. Therefore, the Department does not have authority to use tourism as a basis for determining if permitting requirements have or have not been satisfied for any particular project.

MISCELLANEOUS ISSUES

Will there be adequate fire protection? Commentor would like funds set aside for this.

The applicant intends to work with the local fire department to ensure that there is adequate fire protection. There is an existing water source off Shagg Pond Road. The issue of a local fire protection fund should be taken up at the town level.

Does the DEP have teeth after a proposal is approved to enforce any violations?

The Department often takes enforcement actions on permit holders who violate the terms and conditions of Department Orders.